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Two unusual new species of *Aulacus* Jurine (Hymenoptera, Aulacidae) from South America

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Abstract

Aulacus flavus Smith, **sp. n.** from Brazil and *Aulacus subflavus* Smith, **sp. n.** from Brazil, French Guiana, and Guyana are described. These two species are separated from other *Aulacus* by the enlarged genae, flat mesoscutum, enlarged pronotum, and presence of small tubercles on the mesoprescutum, axillae, and mesoscutellum.

Keywords

parasitoids, South America

Introduction

Both genera of Aulacidae, *Pristaulacus* Kieffer and *Aulacus* Jurine, are widespread in the Neotropics. Twelve Neotropical species of *Aulacus* were listed by Smith (2001). Subsequently, 13 species have been added (Smith 2005a, 2005b, 2008; Smith and Carvalho 2010). Here, I describe two species very different from other *Aulacus* species.

Hosts are not known, but elsewhere aulacids are parasitoids of wood-boring Hymenoptera (Xiphydriidae) and Coleoptera (mainly Buprestidae and Cerambycidae) (Smith 2001, Jennings and Austin 2004).

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Materials and methods

Abbreviations: AEI, American Entomological Institute, Gainesville, FL; RBINS, Royal Belgian Institute of Natural Sciences, Bruxelles; CNC, Canadian National Collection of Insects, Ottawa, Ontario, Canada; MCZ, Museum of Comparative Zoology, Cambridge, MA; USNM, National Museum of Natural History, Smithsonian Institution, Washington DC.

Images were acquired through an EntoVision micro-imaging system. This system included a Leica M16 or Leica DRMB compound microscope with a JVC KY-75U 3-CCD digital video camera or a GT-Vision Lw11057C-SCI digital camera attached that fed image data to a notebook or desktop computer. The program Cartograph 6.6.0 was then used to merge an image series into a single in-focus image.

Terminology follows Huber and Sharkey (1993) and Smith (2008). Descriptions are based on the female holotypes. The species used for comparison (Figs 1–3) is *Aulacus costulatus* (Kieffer), which occurs in Brazil. The specimen illustrated is from Santa Catarina, Nova Teutonia, 27°11'S, 52°23'W, 300–500 m, Nov. 1966, Fritz Plaumann.

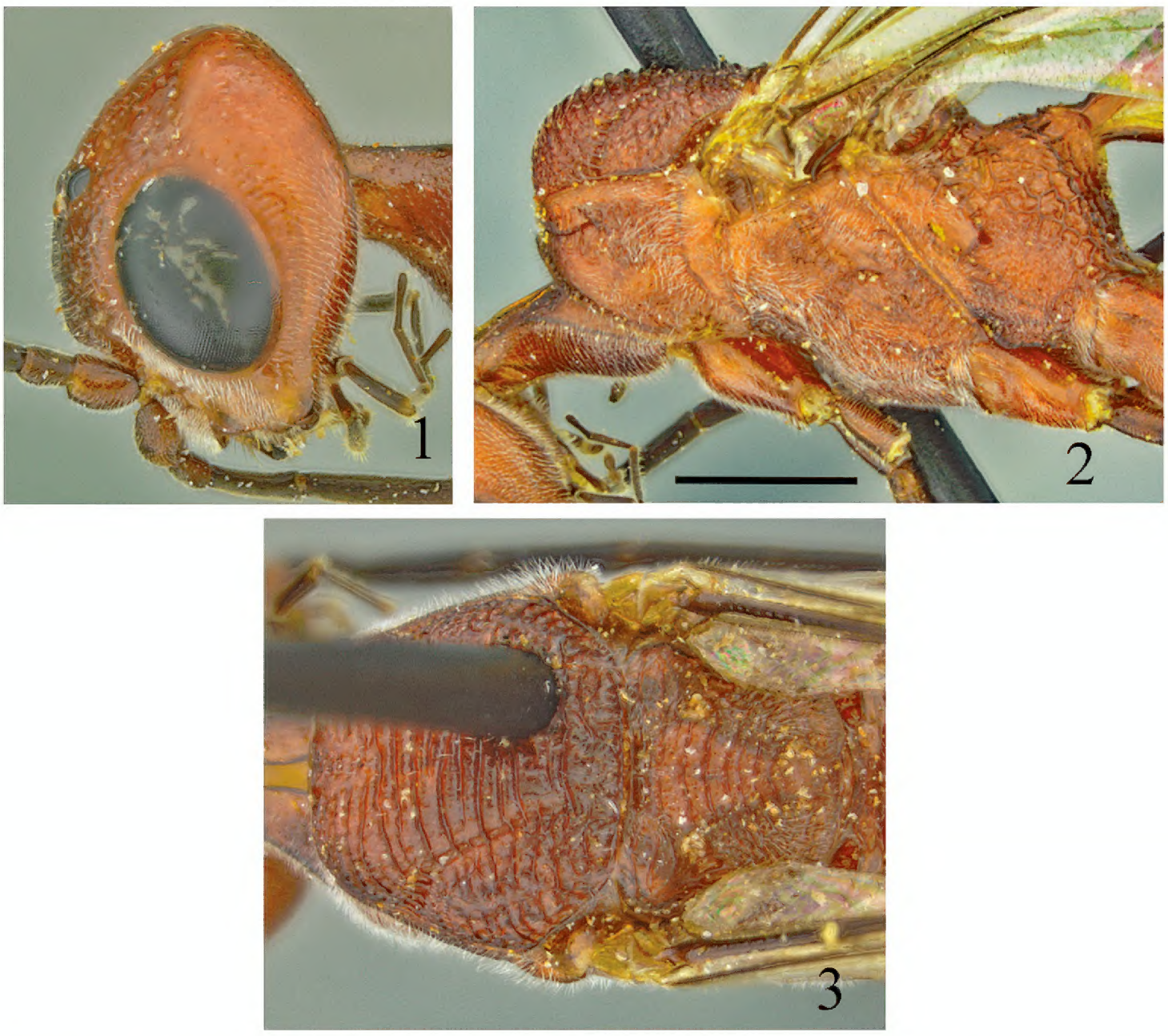
Results

The two species described below belong to *Aulacus* as currently defined (e.g., Smith 2001, 2008; Turrisi et al. 2009). They are distinguished from other *Aulacus* species in the first couplet in the key below. No other species of *Aulacus* share the flat mesoscutum, tubercles on the mesonotum, axillae, and scutellum, enlarged pronotum, and enlarged genae. The exact relationship with other species of *Aulacus* is unknown. Turrisi et al. (2009) considered the genus paraphyletic, and the phylogenetic classification remains unresolved. A study of world *Aulacus* on a much more comprehensive basis is needed to determine relationships of the two species described here.

Key to species

1 Mesonotum (Figs 2, 3) rounded, convex, without tubercles; pronotum in lateral view short, about as long as high and almost triangular (Fig. 2), hardly visible in dorsal view (Fig. 3); head in lateral view with gena not enlarged below, distance between eye and hind margin of head greater dorsally (Fig. 1).... **other *Aulacus***

– Mesonotum (Figs 4, 8, 9, 10, 14, 15) flat, with a short tubercle on each anterolateral corner of mesoscutum, one on each axilla (shown best in Fig. 15), and one on posterior mesoscutellum; pronotum enlarged, in lateral view about 2× longer than high almost rectangular (Figs 9, 15), clearly visible in dorsal view (Figs 8, 14); head in lateral view with gena enlarged ventrally, distance between eye and hind margin of head greater ventrally than dorsally (Figs 5, 11) 2



Figures 1–3. *Aulacus costulatus*. **1** Head, lateral **2** Mesosoma, lateral (scale bar = 1.0 mm) **3** Mesosoma, dorsal.

2 Eyes smaller, lower interocular distance subequal to eye height (Fig. 7); head in lateral view with greatest width of gena more than half width of eye (Fig. 5); head behind eyes in dorsal view slightly convex (Fig. 6); pronotum entirely yellow (Figs 4, 9) ..... ***flavus***

– Eyes larger, lower interocular distance 0.8× eye height (Fig. 13; head in lateral view with greatest width of gena half or less width of eye (Fig. 12); head behind eyes in dorsal view almost straight (Fig. 12); pronotum usually with dorsal half yellow, ventral half black (Figs 10, 15) ..... ***subflavus***

***Aulacus flavus* Smith, sp. n.**

http://zoobank.org/DD80199E-A9A6-44B9-8CF3-785C832A2A52

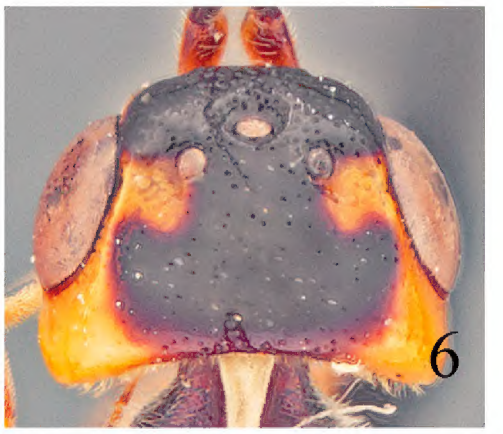
Figs 4–9

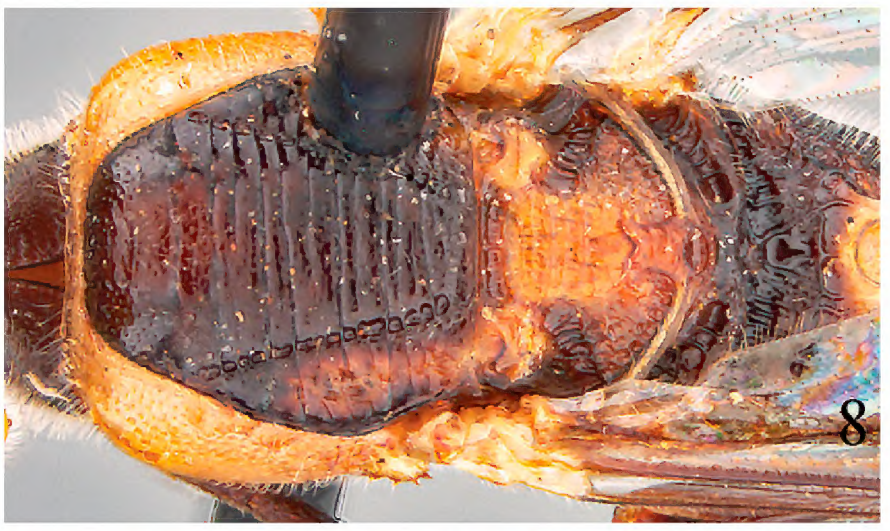
Description. Female (holotype). Length, 9.5 mm; forewing 7.0 mm; ovipositor 4.5 mm. Antenna black; scape yellow. Head yellow with frons and ocellar area and vertex

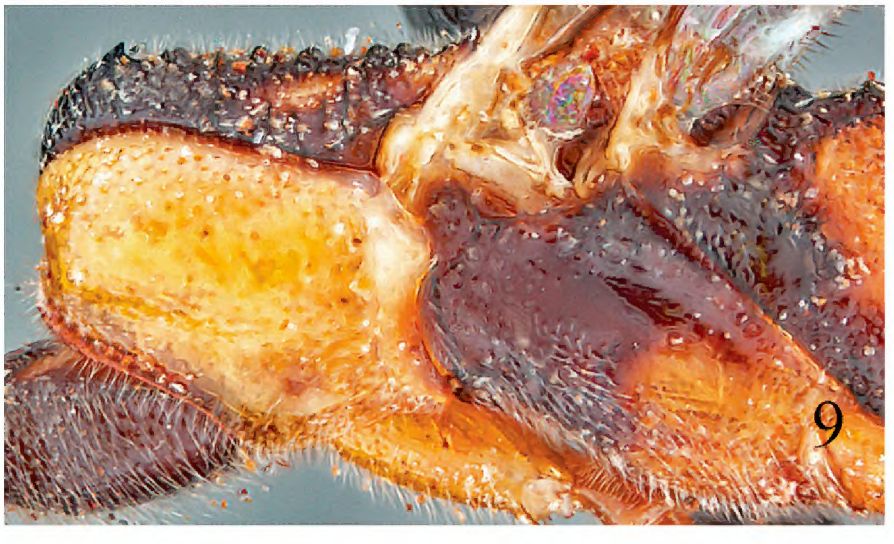
black; lower inner orbits, area below antennae, genae and upper inner orbits with spot extending behind each lateral ocellus yellow. Mesosoma with propleuron black; pronotum yellow, pleurae black with orange spot on lower part of mesepisternum, and mesoscutum, metanotum, and propodeum black. Fore and midlegs orange; apical 1 or 2 tarsomeres dark; hind leg black with extreme apex of coxae, both trochanteral segments, extreme apex of femur and extreme base of tibia and tarsus except for apical tarsomere black. Metasoma orange with tergum 1 black dorsally interrupted by transverse orange band at center, terga 2 to apex each with central black spot, appearing as a longitudinal black stripe; sheath black. Wings hyaline with apex black; veins and stigma black. *Head* (Figs 5–7): Shiny; clypeus and supraclypeal area rugose, with scattered pits separated by flat shiny interspaces several times diameter of an ocellus; pits densest on frons. Antennal length about 3.0× head width; first antennomere longer than broad, second antennomere about as long as broad, third and fourth antennomeres subequal in length. Lower interocular distance subequal to eye height. Malar space about 0.25× eye length. Head behind eyes from above slightly convex behind eyes; in lateral view, lower gena markedly produced with greatest width of gena more than half width of eye. *Mesosoma* (Figs 4, 8, 9): Shiny with fine white hairs; longs hairs laterally and ventrally on propleuron. Propleuron with dorsolateral longitudinal carina; area above carina slightly dulled, microsculptured; area below carina punctured with flat interspaces equal to or slightly more than puncture diameters. Pronotum shiny with widely scattered punctures; vertical scrobiculate line near posterior margin; front and lower margins flangelike. Mesoscutum shiny, with pair of tubercles on anterior margin, area anterior to tubercles punctate, posterior to tubercles with about 10 strong widely spaced transverse carinae; notauli meeting transscutal articulation at separate points; axilla with one or two transverse carinae, each with small tubercle; mesoscutellm with 3 or 4 transverse carinae, with small tubercle near posterior margin, area lateral to mesoscutellum rugulose. Meso- and metapleurae finely punctate, with small shiny impunctate area on upper halves. Propodeum coarsely rugulose. Tarsal claws simple. Hind coxa about 2.2× longer than broad, shiny, punctate, punctures denser and somewhat more rugulose on sides and venter; without projecting ventral lobe; ovipositor guide a very shallow, almost indiscernible oblique groove near apex on inner surface. Hind tarsus about 1.2× length of hind tibia; hind basitarsus subequal in length to remaining tarsomeres combined. Forewing with 2-Rs+M long, longer than first discal cell. Hind wing with 3 hamuli. *Metasoma*: Shiny with short, fine white hairs, densest on apical 3 segments. Ovipositor about 0.7 length of forewing

Male. Length, 8.5 mm. Color and structure similar to female.

Type material. Holotype female, "Brasilien, Rondon [Paraná], 24°38'B, 54°07'L, 500 m, May 1953, Fritz Plaumann" with red holotype label (AEI). Paratypes: BRAZIL: Same data as for holotype (3 ♀, 2 ♂), same data except for dates, X.4.1952 (1 ♂), X.12.1952 (1 ♀), X.16.1952 (1 ♂), X.22.1952 (1 ♂), X.23.1952 (1 ♂), X.26.1952 (1 ♀), X.30.1952 (1 ♀), X.31.1952 (1 ♀), XI.6.1952 (1 ♂), XI.8. 1952 (1 ♀), XI.12.1952 (1 ♂), XI.14.1952 (1 ♂), XI.15.1962 (1 ♂), XI.16.1952 (1 ♂), XI.20.1952 (2 ♂), XI.23.1952 (1 ♂), XI.25.1952 (2 ♂, 1 USNM), XI.28.1952 (1 ♂),







Figures 4–9. *Aulacus flavus*. **4** Lateral (scale bar = 1.0 mm) **5** Head, lateral **6** Head, dorsal **7** Head, front **8** Mesosoma dorsal **9** Mesosoma, lateral.

XI.29.1952 (1 ♂), XII.1.1952 (1 ♂), XII.4.1952 (1 ♂), XII.6.1952 (1 ♂), XII.7.1952 (1 ♂), XII.10.1952 (1 ♂), I.2.1953 (1 ♂), III.1953 (1 ♀), III.29.1953 (1 ♀), IV.1953 (3 ♀, 1 USNM), IV.13.1953 (1 ♀), IV.14.1953 (1 ♀), V.1953, XI.13.1953 (1 ♀),

X.12.1962 (♀ CNC), X.16.1062 (1 ♀ CNC), X.26.1962 (1 ♀ CNC); Rio Caraguatá [Mato Grosso do Sul], 1°48'B, 52°27'L, 400 m, XI.4.1953, Fritz Plaumann (1 ♀), same except dates, III.1953 (1 ♀); III.30.1953 (1♀, 1♂), IV.1953 (1 ♀), XI.21.1953 (1 ♀), XI.22.1953 (1 ♂), XI.24.1953 (1 ♂), XI.25.1953 (1 ♀), XI.30.1953 (1 ♂); Nova Teutonia, Santa Catarina, II.9.1940, Fritz Plaumann, same except dates, I.#.1941 (2 ♀), I.17.1941 (1 ♀), XII.9.1942 (1 ♀ MCZ), X.27.1952 (1 ♀), XI.1.1952 (1 ♀), VI.1953 (1 ♀); Encruzilhada, Bahia, XI.'74, 980 m, M. Alvarenga (1 ♀); Itapetinca, Bahia, 800 m, XI.'69, F. M. Oliveira (1 ♀). Deposited at AEI, except where noted.

Distribution. Brazil: Bahia, Mato Grosso do Sul, Paraná, Santa Catarina. Apparently most common in southern Brazil.

Etymology. From Latin meaning yellow, with reference to the entirely yellow pronotum.

Remarks. There are slight variations in color, especially the amount of orange on the mesonotum and size of black marks on the metasoma. The entirely yellow pronotum seems to be constant in the specimens examined. Size is relatively stable, the length varying only by ±1.0 mm; proportions of the ovipositor and forewing remain the same regardless of length.

Aulacus subflavus Smith, sp. n.

http://zoobank.org/C3AE80D9-6DB6-4ACF-B6E5-D48383DAA3B4

Figs 10–15

Description. Female (holotype). Length, 8.0 mm; forewing 6.0 mm; ovipositor 4.2 mm. Similar to *A. flavus* except for the following differences: Pronotum white on dorsal half, black on ventral half (Figs 10, 15). Head (Figs 11–13) with eyes larger; lower interocular distance 0.8× eye height; in dorsal view straight behind eyes; in lateral view lower gena less produced with greatest width of gena half or less width of eye.

Male. Length, 7.5 mm. Color and structure similar to female.

Type material. Holotype female, "Coll. I.R.Sc.N.B., French Guyana, Kourou, Malaise trap (Piste Soumourou), 15-23.VIII.2001, Leg. D. Faure" with red holotype label (RBINS). Paratypes: FRENCH GUIANA: Same data as for holotype (14 ♀, RBINS, USNM); Coll. I.R.Sc.N.B., Kourou, Piste Skoumourou, Malaise trap, XI.2002, Leg. D. Faure (9 ♀, 5 ♂, RBINS, USNM); Coll. I.R.Sc.N.B., Kourou, Piste Soumourou, Malaise trap, 1-8.IX.2001, Leg. D. Faure (1 ♀, RBINS). GUYANA: Kamakusa, British Guiana, IX.1922, H. Lang, J. Bequaert Collections (1 ♀, MCZ).

Other specimens. BRAZIL: Sinop, M. Grosso, 12°31'S, 55°37'W, X.1974, M. Alvarenga (2 ♀, AEI); Vila Vera, 12°30'S, 50°30'W, October 1973, M. Alvarenga (2 ♀, AEI).

Distribution. Brazil: Mato Grosso; French Guiana; Guyana.

Etymology. From the Latin partly yellow, referring to the usual half yellow and half black pronotum.

Remarks. The "other specimens" are structurally like this species but the mesosoma is entirely yellow orange and I prefer not to include them in the type series. The

Figures 10–15. *Aulacus subflavus*. **10** Lateral (scale bar = 1.0 mm) **11** Head, lateral **12** Head, dorsal **13** Head, front **14** Mesosoma, dorsal **15** Mesosoma, lateral (tubercle on axilla is shown immediately above base of wing).

bicolored pronotum seems to be a helpful character, though several specimens have an entirely yellow pronotum. The side lobes of the mesonotum may be entirely black or partly orange. The length varies only by about ±0.7 mm; the proportions of the ovipositor and forewing remain the same regardless of size.

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References

Huber JT, Sharkey MJ (1993) Structure, pp. 13–59. In: Goulet H, Huber JT (Eds) Hymenoptera of the world: An identification guide to families. Research Branch, Agriculture Canada, Publication 1894/E, 668 pp.

Jennings JT, Austin AD (2004) Biology and host relationships of aulacid and gasteruptiid wasps (Hymenoptera: Evanioidea). In: Austin AD, Dowton M (Eds) Hymenoptera, Evolution, Biodiversity and Biological Control. CSIRO Publishing, Collingwood, 154–164.

Smith DR (2001) World catalog of the family Aulacidae (Hymenoptera). Contributions on Entomology, Inernational 4: 263–319.

Smith DR (2005a) Aulacidae (Hymenoptera) of northern South America, emphasizing Colombia. Transactions of the American Entomological Society 131: 217–253.

Smith DR (2005b) Review of the Aulacidae (Hymenoptera) of Chile and adjacent Argentina. Proceedings of the Entomological Society of Washington 107: 820–834.

Smith DR (2008) Aulacidae of the southwestern United States, Mexico, and Central America (Hymenoptera). Beiträge zur Entomologie 58: 267–355.

Smith DR, Carvalho DV de (2010) Three new species of Aulacidae (Hymenoptera) from Brazil. Proceedings of the Entomological Society of Washington 112: 140–148. doi: 10.4289/0013-8797-112.1.140

Turrisi GF, Jennings JT, Vilhelmsen L (2009) Phylogeny and generic concepts of the parasitoid wasp family Aulacidae (Hymenoptera: Evanioidea). Invertebrate Systematics 23: 27–29. doi: 10.1071/IS08031